CLAIMS

1. Optical mode converter comprising:

- a coupling waveguide (4) having at an input end a first effective refractive index n_{1eff}, the coupling waveguide including a tapered core (41; 402) of a substantially constant refractive index n_1 with a substantially square cross section at the input end (5; 405), having a size that tapers down moving away from the input end, the coupling waveguide having a cladding (42; 403) at least partially surrounding the tapered core; and
- a receiving waveguide (3) having a second effective refractive index n_{2eff} at an output end, comprising a core (31; 404) of a substantially constant refractive index n_2, greater than the refractive index n_1 of the tapered core (41; 402) of the coupling waveguide, and a cladding (32; 403) at least partially surrounding the core,

a side surface (43) of the tapered core of the coupling waveguide being optically in contact, in a coupling portion thereof, with the receiving waveguide so as to allow optical coupling between the coupling waveguide and the receiving waveguide,
wherein the refractive index n_1 of the tapered core of the coupling waveguide is selected so that the first effective refractive index n_{1eff} and the second effective refractive index n_{2eff} differ from each other in absolute value less than 30% of the difference $(n_2 - n_{2eff})$ between the core refractive index and the effective refractive index of the receiving waveguide.

2. Optical mode converter according to claim 1, wherein the refractive index n_1 of the tapered core is selected so that the first effective refractive index n_{1eff} and the second effective refractive index n_{2eff} differ from each other in absolute value less than 20% of the difference $(n_2 - n_{2eff})$ between the core refractive index and the effective refractive index of the receiving waveguide.

3. Optical mode converter according to claim 2, wherein the refractive index n_1 of the tapered core is selected so that the first effective refractive index n_{1eff} and the second effective refractive index n_{2eff} differ from each other in absolute value less than 10% of the difference $(n_2 - n_{2eff})$ between the core refractive index and the effective refractive index of the receiving waveguide.

4. Optical mode converter according to claim 3, wherein the refractive index n_1 of the tapered core is selected so that the first effective refractive index n_{1eff} is substantially equal to the second effective refractive index n_{2eff}.

5. Optical mode converter according to claim 1, wherein the core of the receiving waveguide is tapered over at least a portion that is optically in contact with the coupling portion of the coupling waveguide.

6. Optical mode converter according to claim 5, wherein the tapered core of the receiving waveguide reaches a width W_{2eq}, at an end of its coupling portion opposite to the input end, such that the effective refractive index of the receiving waveguide at said end of the coupling portion is approximately equal for two orthogonal polarization modes.

10. Optical device comprising an optical mode converter according to any one of the previous claims and a launching waveguide (2) coupled to an input end of said coupling waveguide (4).

11. Optical device according to claim 10, wherein said launching waveguide is a single mode optical fiber.

12. Method for fabricating an optical tapered waveguide comprising the following steps:

- growing a bottom cladding layer (32; 401) on a substrate (30),
- digging a wedge shape (41) with a predetermined depth (h) into said bottom cladding layer,
- filling said wedge shape with an optical transmissive material having a refractive index n_1, so as to form a wedge,
- growing a receiving core (404) above said wedge in a way to optically contact at least partially said core layer with an upper surface of said wedge,
- growing a top cladding layer (33; 406) on said receiving core,

wherein the refractive index n_1 of the wedge is selected so that a first effective refractive index n_{1eff} of a receiving waveguide having said wedge as a core and a second effective refractive index n_{2eff} of a waveguide having said receiving core as a

core differ from each other in absolute value less than 30% of the difference ($n_2 - n_{2eff}$) between the refractive index of said receiving core and the effective refractive index of the receiving waveguide.

13. Method according to claim 12, further comprising the step of growing a ridge (34) on the top of the top cladding layer.